Fourmile Project's Proposed Actions Defined

Argonne Cutting Methods:these activities were established in the Argonne Experimental Forest in 1851 and expected to go for 100 years. Ultimately, this research study will implement various activities to better understand the outcome to the following silviculture activities (further definitions of the activities are listed below):

- Selection harvest (down to 60, 75, and 90 ft^2/acre);
- Thinning (down to 80 ft2/acre);
- Canopy gap timber stand improvement (gaps = 1/10-ac)

Argonne Managed Old-Growth Silviculture Study (MOSS) Study: these activities were established in the Argonne Experimental Forest in 2008 and expected to go for 100 years. Ultimately, this research study will implement various activities to better understand how to promote old-growth. Activities in this area would include one of the following (further definitions of the activities are listed below):

- Expanding canopy gap harvest (1/2-tree length, ~35 – 80 feet diameter);
- Canopy gap scarification and seeding
- Thinning (down to 80 ft^2/acre – 110 ft^2/acre);
- Irregular shelterwoods (1 to 3 acre stands);
- Earthworm reduction
- Establishnon-traditional species (increasing resilience)

Canopy Gap Creation: a treatment that is used primarily in northern hardwood stands. Patches of non-merchantable trees are cut to create anywhere from a 25-60 foot gap in the canopy of the tree overstory. This small patch or gap, with no overstory, will be favorable to certain tree species such as yellow birch and hemlock. The ultimate goal is to create a stand that has a high amount of species diversity.

Clearcut harvest (CC):this is an even-aged harvest that removes all merchantable, and unmerchantable trees of all species, with the exception of a few reserve trees, mainly for wildlife purposes. From the direction of the Forest Plan, approximately 2-5 live trees per acre are left behind to grow (Forest Plan at 2-14). In general, this type of cut is used for mature aspen and jack pine stands, species that regenerate best in wide open areas. This harvest can also be used to harvest unhealthy spruce stands where mortality is high and a salvage is needed. Typically, natural regeneration will quickly fill in these areas; if regeneration species composition does not meet project objectives, planting may occur.

Coppice: this is an even-aged activity that removes all tress, with the exception of reserve trees (2-5 live trees left per acre; required by Forest Plan 2-14); this activity is similar to a clearcut harvest but this activity's successful outcome is more dependent on regeneration from stump or root sprouting or suckers. This type of harvest is solely used for mature aspen, a species where stump and root sprouting is prolific.

Harvest: the commercial removal of trees to achieve stated objectives

Improvement Harvest:an intermediate harvestproposed to develop multiple-aged trees in an even-aged or two-aged stand or forest. Less than 40% of the stand would be harvested; this level will depend on how much of the stand is in a desirable age group.The most common use for this type of activity is when trying to convert a mature aspen stand into a northern hardwood stand. In this example, the high risk for mortality aspen are removed to promote healthier trees and the next succession of tree species, i.e. hardwood mix.

Overstory Removal Harvest:this type of activity is similar to a clearcut, however, differs from a clearcut in that there is already an established understory of desired species which would be left after the overstory removal. In other words, the overstory is removed and a new stand is created from the desired understory species. This most commonly occurs in stands that have had preparation and seed tree harvest in the past as part of a shelterwood system, or in aspen/spruce/fir mixed stands where the overstory is high risk of mortality and an understory has developed on its own.

Partial Overstory Removal: similar to an overstory removal activity except that certain trees will be left in the overstory due to those trees being healthy and desired species. This is most commonly proposed when white pine is desired to be left in the overstory while removing declining-in-health aspen.

Pre-Commercial Thinning (PCT): an activity that removesa portion of the non-merchantable trees to enhance the growth and quality of the remaining trees.In other words, this activity would remove approximately 1/3 of the trees to reduce tree competition for sun, light and water. This activity is commonly proposed in pine and spruce plantations.

Reserve Island: these are areas usually used in correlation with even-aged management activities like clearcuts per Forest Plan at 2-14 direction. These vary in size but typically total up to ½ acre for every 10 acres of harvest. These legacy areas keep tree diversity in activity areas and usually include tree species like hemlock, cedar, white pine, red oak, ironwood and yellow birch.

Salvage and Sanitation Harvest: the salvage harvest is a removal of trees damaged by insect, disease, or natural causes such as high winds. The forest in recent years experienced a decline in white spruce stands due to a combination of spruce budworm, a needle drop fungus, drought conditions and root rot. Once the crowns of these trees become too sparse or the percentage of live crown is reduced too far (<33% of the tree) or mortality gets too high (>10% of the tree), a salvage harvest has been used to remove and commercially utilize the trees. The sanitation activity is used on harvests that have similar objectives as the salvage harvest, except that tree death is not completely experienced but it is imminent, i.e. within years.

Site Preparation/Disk Trench/Roller Chop: an activity that usually occurs after a stand has been cleared and is planned to be planted in the following year. This activity prepares the soil for planting seedling, similar to how a gardener would weed or rototill a garden in preparation for planting vegetable seeds. There are several different methods of site preparation including burning, roller chopping (mechanical prep.), and by chainsaw/brush saw (manual prep.). The stand is then usually disk trenched, which is a machine that disturbs the soil and creates rows of holes, making it possible to plant tree seedlings. The objective of this activity is to eliminate all of the unwanted competition for the newly planted seedlings and to prepare the soil for seedling planting,ensuring the best possible survival and use of financial resources.

Salmon Blading: an activity usually implemented after a timber harvest that utilizes a blade (i.e. salmon blade) on a bulldozer. This activity removes all non-woody and small woody vegetation along the forest floor, preparing the soil similarly to how a gardener would weed or rototill a garden in preparation for planting vegetable seeds. This activity is utilized to scrape the ground to create a better seedbed for tree species such as red oak, yellow birch, and hemlock. The result of this activityis exposed bare, mineral soil for the tree seeds. This treatment can be done within canopy gaps or on the entire stand to meet stand regeneration objectives.

Selection Cut (i.e. individual tree selection):a regeneration harvest activity where merchantable trees from different tree diameter classes and different species are selected to be harvested in order to leave multiple species and tree ages in the residual stand. This activity is the most common type of harvest executed in northern hardwood stands, obtaining desired conditions of a multi-aged and resilient stand. This activity removes a small portion of a stand to reduce tree competition to sunlight, water, and soil resources, resulting in better hardwood regeneration.

Shelterwood:this is a multistage or multi-activity approach that usually involves a preparation harvest, a seed harvest, and a removal harvest. The preparation harvest is to structure a stand for a future seed cut; more specifically, this portion of the shelterwood harvest opens up the stand slightly to allow light to enter the stand and removes undesirable trees that the Forest Service doesn't want to regenerate. The seed harvest portion is executed to obtain natural regeneration from residual trees spreading seed to the forest floor. The residual trees also shade new regeneration from too much sun exposure. The removal harvest portion of a shelterwood harvest is an activity that removes the remaining overstory so the newly established tree regeneration can grow without competition from the older trees. A shelterwood harvest is most commonly used in paper birch stands, but can also be used in white pine, northern hardwood, and aspen stands.

Thinning (i.e. commercial thinning):an activity that removes approximately 1/3 of the trees in a stand to enhance the growth and quality of the remaining trees.The high quality and healthy trees are usually not harvested in order to serve as trees that will help for future regeneration of the stand. The suppressed and unhealthy trees are selected to be harvested in order to increase the resources available for the healthy, surrounding trees. The number of residual trees left behind depends on size and spacing of the trees in the current stand.This activity is commonly proposed in pine and spruce plantations.

Timber Stand Improvement (e.g. release): an activity that removes undesired, non-merchantable vegetation so that desired vegetation at the seedling/sapling level will increase in numbers and be healthier. In other words, unwanted species are mechanically removed to reduce the competition on desired species. This can be executed across a whole stand or on an individual tree basis.

Understory Burn: an activity that utilizes prescribed fire at a low intensity to eliminate unwanted species that are out-competing and inhibiting the growth of desired species regeneration. This type of activity is most commonly used in oak and paper birch stands since these species grow well after fire. Also, this activity typically follows a timber harvest in order to achieve regeneration objectives.

Underplanting:an activity that follows harvest activities. This activity plants trees under the existing overstory which serves as a protection from being overly exposed to the sun. This structure helps the tree regeneration get better established in the soil, decreasing mortality rates.